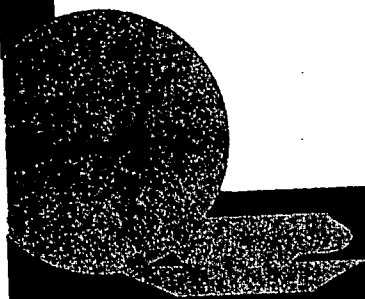
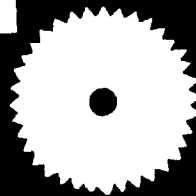
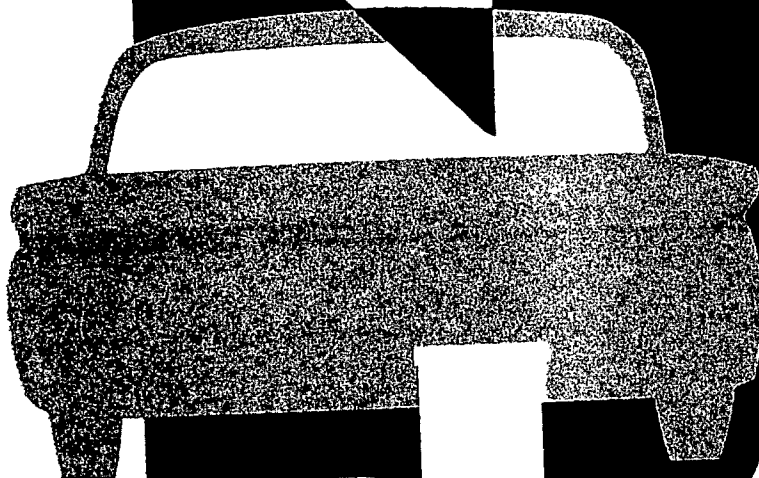
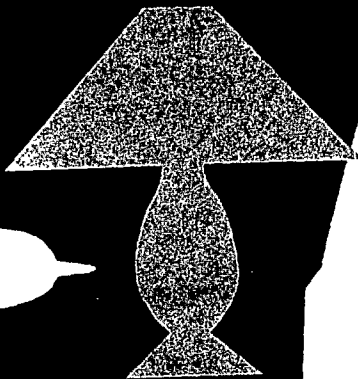
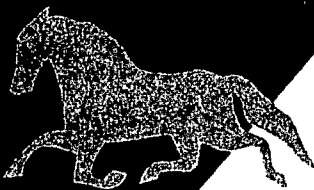


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GP-1021



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SGP 0003342

GYPSUM ASSOCIATION**20 NORTH WACKER DRIVE****CHICAGO 6, ILLINOIS****RECOMMENDED****METHOD FOR DETERMINING
COMPRESSIVE STRENGTH OF GYPSUM CONCRETE
FROM FIELD SPECIMENS***(NOTE: Use only 2 in. Split Cube Molds or 2 in. by 4 in. Cylinders)***SCOPE**

1. This method covers procedures for making and testing compressive test specimens of gypsum concrete sampled as it is poured in place on the job.

SAMPLING

2. (a) The sample shall be obtained by passing a clean, dry non-absorbent container through the stream of concrete as it is deposited in place upon the formboard from the hose, buggy or other conveyor.
- (b) Each sample shall consist of sufficient material to make a complete set of specimens as described in Section 4.
- (c) Each day's pour shall be sampled. At least one sample shall be taken for each 20,000 sq. ft. of slab that is poured. The location in the work where the sample is taken should be noted for future reference.
- (d) The procedures used in sampling shall include the use of every precaution which aid in obtaining samples representing the true nature and condition of the concrete sampled.

MOLDS

3. Molds shall be made of non-absorbent material and shall be substantial enough to hold their form during the molding of test specimens. Molds shall be 2-in. split cube molds meeting the requirements of ASTM Designation: C26, or 2-in. by 4-in. open-end cylinder molds. Cylinder molds shall not vary from the standard diameter by more than 1%, nor from the standard length by more than 2%. Smooth, plane, base and cover plates at least $\frac{1}{8}$ in. thick, of metal or plate glass, shall be provided for the molds.

NUMBER OF SPECIMENS

4. At least 5 specimens shall be made from each sample.

MAKING SPECIMENS

5. The molds and the base and cover plates shall be cleaned and lightly coated with mineral oil (Note: Paraffined cardboard cylinders need not be coated with oil). The molds shall be filled as soon as possible (not more than 5 minutes) after the sample is taken, using a spatula or rod to puddle the concrete as required to prevent entrapment of air and formation of voids. The molds shall be slightly overfilled, with the surplus material rounded at the top. The cover plates shall then be placed on the tops of the molds and firmly pressed down so as to squeeze out the surplus material while avoiding entrapment of air bubbles. This operation shall be completed before the concrete has begun to set. The cover plates shall be removed as soon as practicable but not

until the concrete has set. As an alternative to the use of cover plates, the tops of the molds may be **screeded** smooth and level using a broad knife.

TESTING PROCEDURE

6. (a) The specimens may be removed from the molds as soon as they have hardened, and must be removed from the molds before drying and testing. The specimens shall be protected from freezing and delivered to the testing laboratory within 7 days from the time they are made.
- (b) Before testing, the specimens shall be dried by storing them in moving air at a temperature of not less than 90F nor more than 110F, at a relative humidity of not more than 50%. Weigh the specimens at 1-day intervals until the weight change between successive readings is not more than 0.1%. Remove the specimens when dry, place them in a desiccator over anhydrous calcium chloride for 24 hrs., remove and test immediately. The dry density shall be determined in accordance with ASTM Designation C26.
- (c) The testing machine shall be of any type of suitable capacity which will provide the rate of loading prescribed in Paragraph 6(e). It shall conform to the requirements of Section 14, 15, 16, and 17 of the Method of Verification of Testing Machines (ASTM Designation E4) and to the requirements of Section 2 of the Method of Test for Compressive Strength of Molded Concrete Cylinders. (ASTM Designation C39).
- (d) If the specimens are cubes, they shall be positioned in the testing machine so that the load is applied on surface formed by the faces of the molds, not on the top and bottom.
- (e) The load shall be applied at a constant rate within the range 20 to 50 psi per sec. Increase the load until the specimen fails and record the maximum load carried by the specimen.

REPORT

7. Calculate the load as pounds per sq. inch, and report the average compressive strength of the specimens from each sample, expressing the result to the nearest 5 pounds per sq. inch. Report the dry density of each specimen as determined in accordance with paragraph 6(b) above. Any specimen in a test showing manifest evidence of improper sampling, molding, storage or testing shall be discarded, and the remaining strengths averaged. If the number of remaining specimens is less than 3, the results from the entire sample shall be discarded.

(Over)

NOTES ON STRENGTH TESTS OF GYPSUM CONCRETE

CONDITIONING

To obtain reproducible results in strength tests of gypsum concrete, it is absolutely essential that the specimens be brought to a standard condition of dryness as specified in paragraph 6(b). Discrepancies and conflicts in the results obtained from strength tests of gypsum concrete can almost always be traced to failure in drying the specimens properly and completely.

It must be emphasized that gypsum concrete **DOES NOT REQUIRE CURING** in the sense that the term is applied to portland cement concrete. The specimens need be kept moist only long enough to permit completion of hydration (setting). In the case of a quick-setting material such as gypsum concrete, it is sufficient to keep the specimen moist for 3 hours before they are placed in the dryer.

With suitable means for drying, it should be possible to reach constant weight, as specified in paragraph 6(b), in 3 or 4 days.

It is not possible to accelerate drying by exposing the specimens to temperatures above the range specified, since loss of strength will then result from calcination (dehydration) of the gypsum. It is therefore not acceptable to dry gypsum specimens on top of furnaces or ovens, hot plates, radiators or in any manner which might involve local overheating by conduction or radiation. At very low humidities, calcination could occur (very slowly) within the specified temperature range. Therefore, the specimen should not be left in a dryer for more than one week after they have reached constant weight.

If a suitable low temperature circulating oven is not available, a simple drying cabinet should be built of plywood or hardboard. Any kind of electrical heating element of suitable wattage may be used as a heat source, preferably thermostatically controlled. Specimens obviously must be protected from direct contact with, or radiation from, the element.

A small fan or blower is required for air circulation within the cabinet at a velocity of at least 100 lineal feet per minute. The cabinet must be large enough to accommodate the specimens without crowding. The specimens must be separated so that the air can circulate freely around each one.

The thermometer must be located so that it is shielded from radiation, and so that it indicates the true temperature of the circulating air.

The specification for a maximum humidity of 50% does not imply that equipment is required for control of humidity. This provision is to insure that the cabinet is adequately vented to permit release of moisture removed from the specimens. Obviously, if the cabinet is sealed, humidity will build up and drying will cease.

TESTING

Specimens should be tested as soon as they are removed from the dryer. The dried specimens have an affinity for atmospheric moisture and may show strength changes if allowed to stand in humid air.

Before testing, the bearing surfaces of the specimens should be inspected and any adhering foreign particles removed by careful scraping. If the faces are rough, they should be planed smooth by rubbing on medium sandpaper that is supported by a piece of PLATE glass. While sanding, the specimens must be firmly held to maintain a plane surface.

The specimens must be centered on the platens of the testing machine. Any particles adhering to the platens must be removed before a new specimen is inserted.

**NOTE: Paraffined cardboard cylinders may be obtained from the
Cleveland Container Company, 4925 South Halsted Street, Chicago 9, Illinois**

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